APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,162	07/09/2003	Jianying Li	131214	9757

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Patrick W. Rasche
Armstrong Teasdale LLP
Suite 2600
One Metropolitan Square
St. Louis, MO 63102

EXAMINER
CHU, RANDOLPH I

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>12 February 2007</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-8,10-18 and 20-25</u> is/are rejected.

7)☒ Claim(s) <u>9 and 19</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>7/9/2003</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claim (s) 1-4, 10-14 and 20-24 are rejected under 35 USC 103(a) as being

unpatentable over Kato et al. (US Patent 4,317,179) in view of Akahori (US

2003/0179945).

With respect to claim 1, Kato et al. teaches, obtaining an image (abstract); and

obtaining a final pixel value by performing a filtering operation on an initial pixel value of

at least one pixel of the image and by modulating the filtering operation with a gain

factor that is a function of the initial pixel value (abstract, col. 3 line 64- col. 4 line 2, col.

lines 8-13).

Kato et al does not teach gain factor that is a function of a relative pixel value

which is calculated based on a threshold value T.

Akahori teaches gain that is a function of a relative pixel value which is

associated with a threshold (para. [0044])

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use gain factor that is a function of a relative pixel value which is calculated based on a threshold in the method of Kato et al.

The suggestion/motivation for doing so would have been that threshold value used to limit gain factor so that output of filter is in desirable range.

Therefore, it would have been obvious to combine Akahori with Kato et al. to obtain the invention as specified in claim 1.

With respect to claim 2, Kato et al. teaches, obtaining the final pixel value comprises obtaining the final pixel value by using $P_f(i,j)=P(i,j) - (P(i, j) - decon(P(i,j)))*Gain(i,j)$, wherein $P(i,j)$ (D_{org}) the initial pixel value, $decon(P(i, j))$ (D_{us}) is a deconvolution operation performed on the initial pixel value, $Gain(i, j)$ (β) is the gain factor of the pixel, and (i, j) is the pixel (abstract, col. 3 line 64- col. 4 line 2, col. lines 8-13).

With respect to claim 3, Kato et al. teaches, categorizing the image into at least two regions of low, medium, and high density (col. 11 lines 13-41).

With respect to claim 4, Kato et al. teaches modulating the filtering operation comprises: performing a smoothing operation on one of the regions; and limiting the smoothing operation to the region (col. 3 lines 40-63).

With respect to claim 5, Akahori teaches determining the threshold value base on a predetermined value (para [0044]).

With respect to claim 6, Akahori teaches generating a gain factor curve as a function of the relative pixel value of each pixel of the image (Fig. 2, para [0044]).

With respect to claim 10, please refer to rejection for claim 1.

With respect to claim 11, please refer to rejection for claim 1.

With respect to claim 12, please refer to rejection for claim 2.

With respect to claim 13, please refer to rejection for claim 3.

With respect to claim 14, please refer to rejection for claim 4.

With respect to claim 15, please refer to rejection for claim 5.

With respect to claim 16, please refer to rejection for claim 6.

With respect to claim 20, please refer to rejection for claim 1.

With respect to claim 21, please refer to rejection for claim 1.

With respect to claim 22, please refer to rejection for claim 2.

With respect to claim 23, please refer to rejection for claim 3.

With respect to claim 24, please refer to rejection for claim 4.

With respect to claim 25, please refer to rejection for claim 5.

3.   Claim 7, 8, 17 and 18 are rejected under 35 USC 103(a) as being unpatentable
over Kato et al. (US Patent 4,317,179) in view of Akahori (US 2003/0179945) and in
further view of Nakamura et al. (US Patent 5,649,031).

With respect to claim 7, Kato et al. in view of Ahmed et al. teaches all the
limitations of claim 6 as applied above from which claim 7 respectively depend.

Kato et al. in view of Ahmed et al. does not disclose calculating an effective pixel
value from the initial pixel value by using ($P_e(i,j)=(P(i,j)+P(i-1,j)+P(i+1,j)+P(i,j-1)$
$+P(i,j+1))/.sup.5$, wherein $P_e(i,j)$ is the effective pixel value, and $P(i-1, j)$, $P(i+1, j)$, $P(i, j-1)$, and $P(i, j+1)$ are pixel values of pixels that are adjoining the pixel with pixel value
$P(i, j)$.

Nakamura et al. teaches calculating an effective pixel value from the initial pixel
value by using ($P_e(i,j)=(P(i,j)+P(i-1,j)+P(i+1,j)+P(i,j-1) +P(i,j+1))/5$, wherein $P_e(i,j)$ is the
effective pixel value, and $P(i-1, j)$, $P(i+1, j)$, $P(i, j-1)$, and $P(i, j+1)$ are pixel values of
pixels that are adjoining the pixel with pixel value $P(i, j)$. (Fig. 3B, col. 3 line 64-col.4
line 19, $A(h) = (c+g+h+l+m)/5$).

Kato et al. and Ahmed et al. are analogous art because they are in the "same
field of endeavor", image processing.

At the time of the invention it would have been obvious to a person of ordinary
skill in the art to use $P_e(i,j)=(P(i,j)+P(i-1,j)+P(i+1,j)+P(i,j-1) +P(i,j+1))/5$ to determine
effective pixel value in the method of Kato et al.

The suggestion/motivation for doing so would have been that even weighted average of neighbor pixel to blur the image.

Therefore, it would have been obvious to combine Nakamura et al. with Ahmed et al. and Kato et al. to obtain the invention as specified in claim 7.

With respect to claim 8, Ahmed et al. teaches calculating the relative pixel value $P_r(i,j)$ from the effective pixel value by using $P_r(i,j)=P_e(i,j)/T$ (col. 10 lines 13-28).

With respect to claim 17, please refer to rejection for claim 7.

With respect to claim 18, please refer to rejection for claim 8.

Allowable Subject Matter

4.   Claims 9 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: claim 9 and 19 are allowable over the prior art of record because non of the prior art of record teaches the combined claimed elements as set forth in the claims 9 and 19.

None of the prior art of record teaches or fairly suggests that image processing method

for filtering using gain factor of

$$Gain(i, j) = -0.35 + 0.1 * P_r(i, j) + 0.15 * P_r(i, j)^2 + 0.2 * P_r(i, j)^3 + 0.4 * P_r(i, j)^4 + 0.5 * P_r(i, j)^5,$$

and together with combination of other claimed elements as set forth in the independent

claims 9 and 19.Therefore, the claims 9 and 19 are over the prior art of records.

Conclusion

5.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

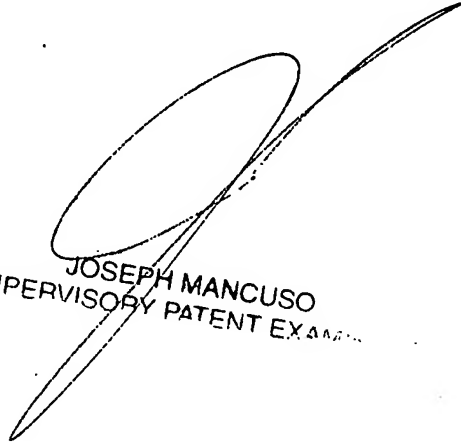than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randolph Chu whose telephone number is 571-270-1145. The examiner can normally be reached on Monday to Thursday from 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-76957695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent. Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RIC/

JOSEPH MANCUSO
SUPERVISORY PATENT EXAM...